SD431.5
A2M4

TIMBER MANAGEMENT PLAN

MEDICINE BOW WORKING CIRCLE

FY 1962 - 1971

MEDICINE BOW NATIONAL FOREST
WYOMING

Region 2

REGION TWO

FOREST SERVICE

U. S. DEPARTMENT OF AGRICULTURE

TIMBER MANAGEMENT
PLAN

MEDICINE BOW WORKING CIRCLE

FY 1962 - 1971

MEDICINE BOW NATIONAL FOREST
WYOMING

Region 2

Prepared by:

/s/ S. H. Van — 3/1 — 19 61

Approved by:

/s/ W. E. Augsbach — 3/16 — 1961
Forest Supervisor

/s/ H. C. Eriksson — 4/17 — 1961
Acting Regional Forester

/s/ Edward P. Cliff — 5/1 — 1961
DJM Acting Chief

Reviewed by:

Regional Office	Initials	Date
Engineering	ML	4/13/61
Timber Management	CCA	4/13/61
Washington Office		
Timber Management	IJM	4/27/61

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CONTENTS

Page

State Map

Summary of Plan
Table 1 - Annual Allowable Cut for the Regulated Areas and Volume by Species for the Regulated Area 1
Table 2 - Unregulated Types. 2
Table 3 - Area by Ownership, Land Classification and Stand Size Class 2
Table 4 - Area by Timber Types, Stand Size and Stocking Class. 3
Table 5 - Total Volume by Ownership. 4
Table 6 - Summary of Total Area, Net Volume Per Acre and Total Volume by Species for Major Sawtimber Types. 5
Table 7 - Periodic Annual Net Growth 6
Table 8 - Recommended Rotation 6
Revision Date. 6

Introduction. 7

Summary of Results Under Previous Plans 8
Graph - Allowable Cut and Actual Cut Compared. 10

Management Objectives 11

Multiple-Use Coordination 13

Regulation. 14
Rotation 14
Methods of Cutting 14
Growing Stock. 15

Table 9 - Area to be Thinned and Clear Cut by Crown Density Classes, Lodgepole Pine Poletimber Type 16

Table 10 - Showing Area by Stand Size Classes and Adjusted Area for Growing Stock for Regulated Types 17

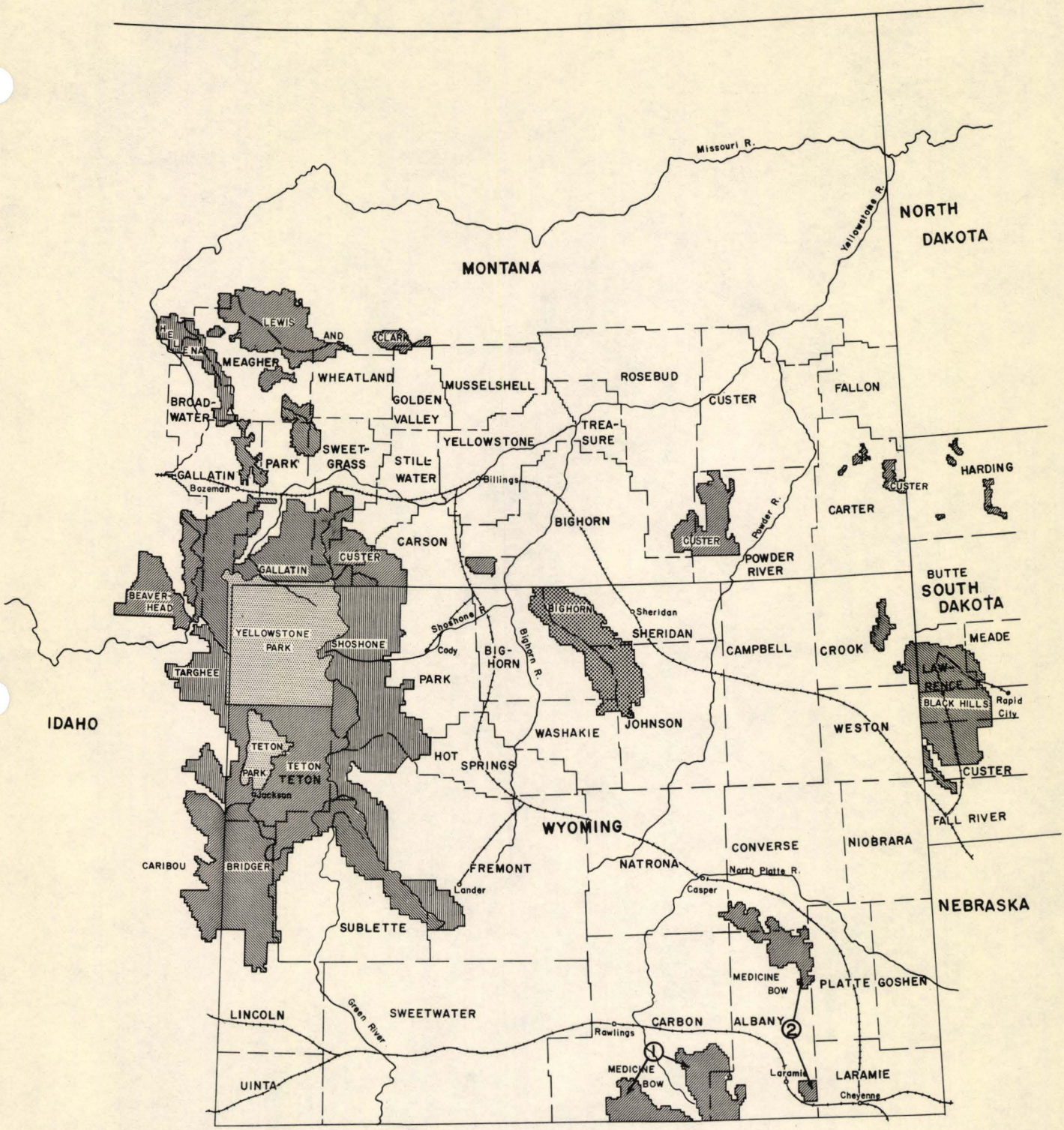
Growth and Mortality 18

CONTENTS (continued)

	Page
Calculation of Allowable Cut	18
Lodgepole Pine Sawtimber Type	18
Table 11 - Summary of Annual Growth and Mortality for Sawtimber Types	19
Table 12 - Allowable Cut - Area and Volume by 10-Year Periods	21
Spruce-Fir Sawtimber Type	22
Lodgepole Pine Poletimber Type	24
Calculation of Volume to be Cut from Regulated Area Based on International 1/4" Log Rule and Cubic Feet	25
Allowable Cuts Beyond the 40-Year Adjustment Period	27
Calculation of Unregulated Cut	28
Cutting Budget	28
Table 13 - Cutting Budget	29,30,31
Transportation	32
Table 14 - Timber Access Road Development Program	33,34,35
Sales Policy	36
Points of Manufacture	36
Merchantability Specifications	36
Logging Methods	36
Stand Improvement	38
Reforestation Survey	38
Planting	38
Measures to Aid or Control Natural Regeneration	38
Thinning	38
Table 15 - The Planting Job	40
Protection	41
Insects	41
Disease	42
Animals	42
Fire	43
Acquisition	45

CONTENTS (Continued)

	Page
Supporting Data	46
Compartment Records	46
Timber Inventory	46
Sampling Error	47
Data Processing	47
Method for Calculating Periodic Annual Net Growth	48
Table 16 - Average Age and Height by Species for DBH 2" Classes	49
Table 17 - Distribution of Site Trees by Major Types, Stand Size Classes and Age Classes	50
Average Net Volume and Annual Net Growth Per Acre:	
Table 18 - Douglas-fir Sawtimber Type	51
Table 19 - Lodgepole Pine Sawtimber Type	52
Table 21 - Lodgepole Pine Poletimber Type	54
Table 23 - Spruce-Fir Sawtimber Type	56
Table 25 - Aspen Sawtimber and Poletimber Type	58
Stock and Stand Tables:	
Table 20 - Lodgepole Pine Sawtimber Type	53
Table 22 - Lodgepole Pine Poletimber Type	55
Table 24 - Spruce-Fir Sawtimber Type	57
Table 26 - Area, Volume Per Acre, and Total Volume by Volume Stratum	59
Table 27 - Area, Volume Per Acre, and Total Volume by Volume Stratum for State and Privately Owned Lands	60
Compartment Map	61



R·2 FORESTS IN WYOMING AND ADJACENT FORESTS OF OTHER REGIONS

Traced by P.S. Miller
from maps of R-1, & R-2, 3/23/59

Scale
20 0 20 40 Miles

LEGEND

① Medicine Bow Working Circle

② Laramie Peak Working Circle

MEDICINE BOW NATIONAL FOREST

GPO 847530

SUMMARY OF PLAN

Table 1

Annual Allowable Cut for the Regulated Areas

Type	Area Acres	Volume		
		Scribner Dec. C	International 1/4"	Cubic Feet
		MBF	MBF	MCF
Lodgepole Pine Sawtimber (LP9)	4,300	33,500	41,700	10,200
Spruce-Fir Sawtimber (SF9)	2,260	25,600	28,700	6,000
Lodgepole Pine Poletimber (LP8)	7,500	---	---	8,500
Total	14,060	59,100	70,400	24,700

Volume by Species for the Regulated Area
Scribner Dec. C Log Rule

Species	Sawtimber Types			Poletimber Type
	Lodgepole Pine	Spruce-Fir	Total	Lodgepole Pine
	MBF	MBF	MBF	MCF
Lodgepole Pine	28,056	2,092	30,148	7,905
Engelmann Spruce	3,079	18,232	21,311	223
Subalpine Fir	2,090	5,005	7,095	207
Douglas-fir	7	--	7	52
Limber Pine	121	15	136	66
Aspen	147	256	403	97
Total	33,500	25,600	59,100	8,550

Table 2

Unregulated Types

Total Volume

Types	Area Acres	Volume
Aspen	54,610	70,809 M C.F.
Douglas-fir & Ponderosa Pine Sawtimber	4,449	11,681 M B.F.(Scribner Dec. C)
Residual Volume in Current Lodgepole Pine Sawtimber Cutover Areas (Trees 5.0 - 8.9 inches d.b.h.)	4,300	2,296 M C.F. available for cutting per year

Table 3

Area by Ownership, Land Classification, and Stand Size Class

Land Classification	National Forest	State	Private	Total
		Acres		
Commercial Forest Land - Unreserved				
Large Sawtimber	1,209	0	25	1,234
Small Sawtimber	283,948	3,909	6,577	294,434
Poletimber	342,273	4,736	10,934	357,943
Seedling-Sapling	38,695	185	1,262	40,142
Nonstocked	7,576	2	575	8,153
Sub-Total	673,701	8,832	19,373	701,906
Reserved	771	0	0	771
Non-Commercial	38,725	784	2,773	42,282
Non-Forest	133,057	4,340	13,753	151,150
Grand Total	846,254	13,956	35,899	896,109

Table 4

Area of Commercial National Forest Land by Timber Types,
Stand Size, and Stocking Classes

Types	Non-Stocked	Seedling-Sapling				Poletimber				Small Sawtimber			Large Sawtimber			Total
		Well	Med.	Poor	Total	Well	Med.	Poor	Total	Med.	Poor	Total	Med	Poor	Total	
Douglas-fir					0	413	1468	209	2090	385	3973	4358			0	6448
Ponderosa Pine					0			50	50		91	91			0	141
Lodgepole Pine	3310	15590	13021	1585	30196	120164	111893	24991	257048	42486	128059	170545			0	461099
Spruce-Fir	4266	122	1794	612	2528	631	9427	18505	28563	50030	58836	108866	959	250	1209	145432
Total Softwoods	7576	15712	14815	2197	32724	121208	122788	43755	287751	92901	190959	283860	959	250	1209	613120
Aspen and Cottonwood*					5971				54522			88			0	60581
Grand Total					38695				342273			283948			1209	673701

*Aspen and Cottonwood unclassified as to stocking classes.

Table 5

Total Volume for Commercial Forest Lands
by Ownership

Ownership	Total Volume		
	Board Feet Trees 11.0" d.b.h. and larger		Cubic Feet Trees 5.0" d.b.h. and larger
	International 1/4" MM B.F.	Scribner Dec. C MM B.F.	MM C.F.
Softwood Types			
National Forest	2,714	2,354	1,142
State	30	26	12
Private	54	46	23
Total	2,798	2,426	1,177
Hardwood Types			
National Forest	39	33	71
State	1	1	2
Private	2	2	4
Total	42	36	77
Grand Total			
National Forest	2,753	2,387	1,213
State	31	27	14
Private	56	48	27
Total	2,840	2,462	1,254

Table 6

Summary of Total Area, Net Volume Per Acre and Total Volume By Species
For Major Sawtimber Types - National Forest Unreserved Lands
Scribner Dec. C Log Rule - Trees 9.0" d.b.h. and Larger

Type	Area Acres	Volume Per Acre Bd.Ft.	Total Volume by Species							
			Douglas-fir	Ponderosa Pine	Lodgepole Pine	Limber Pine	Subalpine Fir	Engelmann Spruce	Aspen	Total
			M Bd. Ft.							
Douglas-fir / Ponderosa Pine	4,358 / 91	2,625.44	7,264	3,205	828	145	--	--		11,442
Lodgepole Pine	170,545	7,722.70	263	--	1,103,044	4,741	82,185	121,040	5,795	1,317,068
Spruce-Fir	110,075	11,433.52	--	--	102,823	755	246,045	896,336	12,585	1,258,544
Hardwoods	88	3,283.03	--	--	67	--	--	--	222	289
Total	285,157	8,213.40	7,527	3,205	1,206,762	5,641	328,230	1,017,376	18,602	2,587,343
Percent			0.29	0.12	46.64	0.22	12.69	39.32	0.72	100

Type	Percent
Douglas-fir / Ponderosa Pine	00.44
Lodgepole Pine	50.90
Spruce-Fir	48.65
Hardwoods	00.01
Total	
Percent	100

Table 7

Periodic Annual Net Growth Based on Past 10 Years
for Trees 5.0" d.b.h. and Larger

Type	Cubic Feet per Acre	Total for Type (MCF)
Lodgepole Pine		
Sawtimber	+6.65	+1,134
Poletimber	+29.21	+7,508
Spruce-Fir		
Sawtimber	-7.13	-785

Table 8

Recommended Rotation

Type	Years
Lodgepole Pine	120
Spruce-Fir	140

Revision Date: June 30, 1971

TIMBER MANAGEMENT PLAN

for the

MEDICINE BOW WORKING CIRCLE

INTRODUCTION

This working circle plan is a timber management action program for the 10-year period FY 1962 to 1971. It prescribes for the working circle the action necessary in this period to meet the long-term objectives set forth in the General Timber Management Statement for the Medicine Bow National Forest.

This plan will be revised by June 30, 1971. Earlier revisions of the plan will be made if necessary to meet changing conditions.

Detailed Forest Survey data from which tabular summaries were made are on IBM sheets filed in a binder labeled "Forest Survey, Wyoming, IBM Sheets, Medicine Bow National Forest, Sample Unit 23." This binder is located in the forest supervisor's office at Laramie, Wyoming.

Compartment records containing compartment descriptions including area and volume breakdown by types and type maps are filed in the timber management atlas. These records are kept posted annually. The current action recorded includes volume and area cut, stand improvement, losses from fire, etc. and changes in ownership. The records are maintained in the district ranger's office.

SUMMARY OF RESULTS UNDER PREVIOUS PLANS

This working circle plan, as described in the General Timber Management Statement consolidates those portions of the Bow River, Platte River, Railroad and Snake River Working Circles that were within the Medicine Bow National Forest. The combined annual allowable cut for the four working circles was 30,175 M B.F. During 1954 the allowable cut was increased to 49,000 M B.F., as an interim adjustment, and was to remain in effect until the plans could be revised.

The following shows the accomplishment during the past decade.

Harvesting Accomplishments

The comparison between the actual cut and the allowable cut for the past 10 years is shown on Chart 1. For the 10-year period FY 1950-1959, the actual cut was 299 million feet b.m. This represents an undercut of approximately 100 million feet b.m. for the period. The allowable cut was not attained principally because of a lack of demand from industry.

Timber Stand Improvement and Reforestation Accomplishments

1. Thinning

   A total of 1,147 acres of noncommercial thinning has been done in lodgepole pine. This was accomplished on cutover areas through sale area betterment deposits.

2. Planting

   Satisfactory survival has been obtained on 1,150 acres out of a total of 4,074 acres planted. Species planted were largely lodgepole pine.

3. Seeding

   A total of 460 acres of lodgepole pine was seeded on the non-restocked Turpin Creek burn. The results were satisfactory.

Protection Accomplishment

1. Disease Control

   Dwarfmistletoe control has been done on 2,412 acres of lodgepole pine clear-cut area. All of this has been accomplished within the last five years.

2. Insect Control

There have been no epidemic outbreaks within the past 10 years requiring control measures.

3. Fire Control

In the 10-year period 1948 to 1957, there were 144 fires in the working circle. Of these, 97 were man-caused. The total area burned was 5,278 acres, or an average of 528 acres per year. There were 3,866 acres of commercial timberland burned in the 120 fires which occurred on such lands.

Area Put into Good Growing Condition

Approximately ten thousand acres of lodgepole pine type have been put into good growing condition during the past 10-year period. This includes clear-cut areas on which dwarfmistletoe control work has been completed, area thinned and areas successfully regenerated.

Allowable Cut and Actual Cut Compared

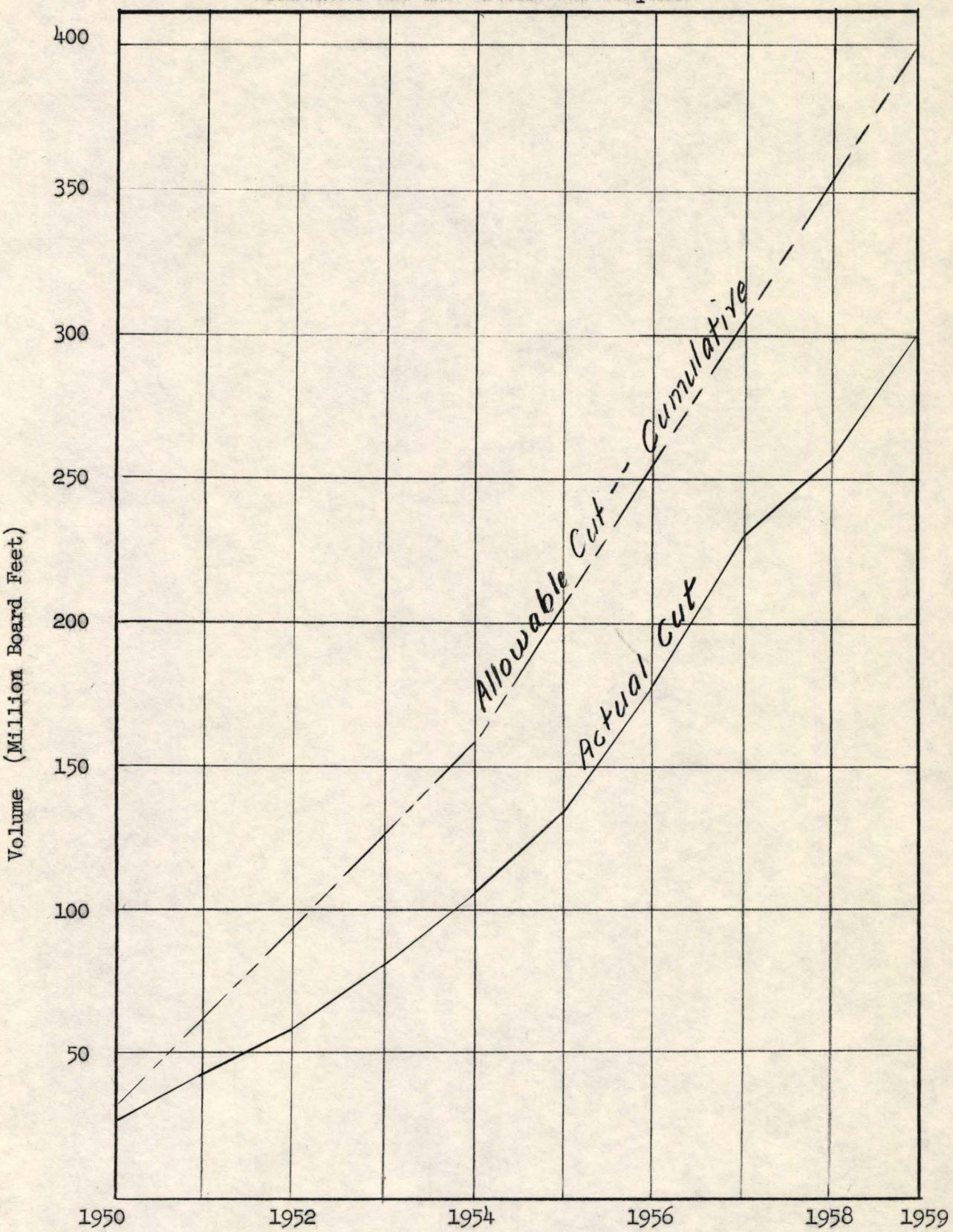


Chart 1

MANAGEMENT OBJECTIVES

The long-range objective of timber management is the attainment of the sustained yield capacity of the working circle. Under proper stand conditions and silvicultural treatment, an average annual growth of 150 ft. b.m. per acre is reasonable. This growth rate applied to the 673,700 acres of commercial forest land in the working circle would produce a total annual growth of 100 million board feet. To attain this objective, all overmatured, under or overstocked stands must be put into good growing condition.

This working circle plan is geared to attaining the above objective by the year 2,000 A.D. The following accomplishments will, therefore, be needed in the 10-year period, FY 1962-1971.

1. Meet the allowable cut for sawtimber for the period by making more sales to the local sawmill industry. This will mean approximately a 12 percent increase in timber cutting. Timber sale promotion will be stepped up to accomplish this by FY 1964.

2. In cooperation with adjacent forests, establish an industry in southern Wyoming or northern Colorado that will utilize small, round material from trees smaller than 9.0 inches d.b.h. A pulp, ground, or chipped-wood plant could use material of this size. The raw material would come from old tie cutover areas, small trees in current sawtimber sales, and from intermediate cuttings in lodgepole pine. Efforts will be geared for establishment of this industry in 1970.

3. Reduce infections of dwarfmistletoe in lodgepole pine by destroying the infected residual stands in accordance with standards in the Timber Management Guides FSH2-2442.8. This will amount to 7,500 acres of disease control during the 10-year period.

4. Conduct a reforestation program which will include:

   a. Adequately stocking, by seeding or planting, as much of the 9,773 acres of commercial forest land classed by the forest survey as nonstocked or as poorly stocked seedling-sapling lodgepole pine and spruce-fir type as is practicable.

   b. Insuring prompt and adequate regeneration on sawtimber cutover areas deficient in natural regeneration, by seeding or planting within three years after cutting.

c. Re-establishing lodgepole pine and spruce-fir types on areas which reverted to aspen by fire or other destructive action. Such planting would be practicable on an estimated 15,116 acres of aspen type in the 10-year period.

5. Prepare detailed plan to convert 15,000 acres of aspen type to productive lodgepole pine and spruce-fir type.

6. Maintain proper stocking in lodgepole pine stands by:

   a. Thinning commercially, 162,000 acres of poletimber stands during the next 40 years. Unless additional industry is developed to utilize small, round material, only 3,000 acres of such work can be accomplished in this 10-year period. This will be done mostly through small sales.

   b. Thinning, noncommercially, 20,000 acres of new growth in the lodgepole pine type currently being cut over.

7. Prevent epidemic outbreaks of destructive forest insects. This will be done principally through a good detection program and by preventive action required of the purchaser in timber sale contracts.

8. Keep commercial forest land fire damage within the annual PAR established for the current 10-year period. The "long-term burned area objective" or "tolerable annual burn" for the 673,700 acres of commercial forest land is 540 acres.

MULTIPLE-USE COORDINATION

Timber cutting within occupancy zones, such as the travel influence zone along State Highways 130 and 230, and within the water influence zones will be in accordance with the practices described in the Timber Management Guides, FSH 2-2442.8, FSM-FSH 2300 and 2400, and in accordance with approved Multiple-Use Block Plans for the Medicine Bow National Forest.

When presale prescriptions are prepared for timber sale areas, reference will also be made to FSM 2100, to the Multiple-Use Plan for Eastern Wyoming, and to the Multiple-Use Block Plans for the Medicine Bow National Forest.

REGULATION

Regulation will be by area, with the allowable cut expressed in both area and volume. Control will be by 10-year periods. Undercuts that have built up during the period may be cut during the remainder of the same period, provided that the total cumulative cut does not exceed the allowable periodic cut by more than 10 percent. The control of the allowable cut will be by type area and not by species or products cut within the type. Sales programs will be by species and products and will be in volumes sufficient to meet area control objectives. Sales programs will normally exceed allowable cut objectives; otherwise the average annual cut will fall short of meeting the 10-year objective. Emphasis will be placed on increasing the current actual cut until experience shows the allowable cut objectives are assured.

The financed cut for any one year is based upon volume and includes the cut from both the regulated and unregulated areas. The financial cut quota should be sufficient to meet both volume and area objectives for the forest as a whole.

If the present relationship between area and volume is found to be out of proportion for the forest as a whole, the volume allowable cut will be adjusted to be consistent with area regulation. No adjustment, however, will be made prior to the end of the first five-year period.

Rotation

Previous plans used rotations of 160 to 200 years. Since a 40-year adjustment period is used to convert wild stands to managed stands, a rotation is not important at this time. Better information is needed to establish the length of the rotation and this will be collected during the next 10 years.

For the purpose of using the Kemp formula as a comparison with the tabulation method of determining the allowable cut, the following rotations are used:

Lodgepole Pine Type	120 years
Spruce-Fir Type	140 years

The periods include five years for regeneration after logging.

Methods of Cutting

Region 2's Management Guide for Lodgepole Pine, Engelmann Spruce and Ponderosa Pine, FSH2-2442.8 will be applied in timber marking. This guide provides for clear cutting by patches or strips with even-age management as the objective for the lodgepole pine and spruce-fir types and a shelterwood silvicultural system for ponderosa pine.

Growing Stock

The forest inventory divides the major timber types into stand size classes and stocking classes. The definitions for these classes are Forest Survey standards, as follows:

Sawtimber	Trees 11.0" d.b.h. and larger
Poletimber	5.0" to 10.9" d.b.h.
Seedling-Sapling	1.0" to 4.9" d.b.h.

Stocking classes or crown density classes refer to the extent to which growing space is utilized by present growing stock trees of commercial species. The classification is based on the percent of crown closure. The crown density classes for sawtimber stands, as used in this plan, are for the percent of closure of sawtimber crown. The stocking classes for poletimber and seedling-sapling stands are based on crown closure for all trees regardless of their size.

Classification	Percent of Crown Closure
Well stocked	70+
Medium stocked	40 to 69
Poorly stocked	10 to 39
Nonstocked	0 to 9

Condition classes were not used in the survey. The breakdown into stand size classes is purely on size and does not reflect the growing potential of the trees into the next larger size class. For example, some areas of stagnated lodgepole pine were typed as poletimber. Considering the age and overstocking, some of these stands are not likely to grow into sawtimber size stands. Such lands can be put into production only by the removal of the present stand and regenerating the area.

Because of the above described situation, it was necessary to adjust Forest Survey's area of lodgepole pine poletimber type so that it would include only those stands having a chance of growing into sawtimber. This adjustment was based on an estimate of the acreage of lodgepole pine poletimber type that should be thinned and clear cut. Age, stocking and the prevalence of dwarfmistletoe were the influential factors. Stagnated stands over 70 years of age cannot be expected to grow into sawtimber.

Also, stands that are heavily infected with dwarfmistletoe should be clear cut. Site tree ages were used as a guide in determining the distribution of age classes.

Of the 257,048 acres of lodgepole pine poletimber type, it was estimated that 162,440 acres would likely grow into sawtimber and 94,608 acres should be reclassified as nonstocked as far as growing stock is concerned. The acres and percentage by stocking classes are shown in the following table:

Table 9

Lodgepole Pine Poletimber Type
Areas to be Thinned and Clear Cut
by Crown Density Classes

Crown Density Classes	Area to be Thinned		Area to be Clear Cut		Total Acres
	Acres	Percent	Acres	Percent	
Well	84,115	70	36,049	30	120,164
Medium	78,325	70	33,568	30	111,893
Poor	0	0	24,991	100	24,991
Total	162,440	--	94,608	--	257,048
Percent of Total		63		37	100

No adjustment to reflect growing stock is necessary in the Forest Survey's area of spruce-fir poletimber type.

Table 10 summarizes the area of stand size classes for the lodgepole pine and spruce-fir types. This table indicates a shortage of area in the seedling-sapling size and an overabundance of area in the nonstocked class for a desirable distribution of stand size classes for lodgepole pine. For the spruce-fir type 75 percent is in sawtimber size which, of course, is an undesirable distribution especially since mortality is exceeding growth.

Table 10

Showing Area by Stand Size Classes
and
Adjusted Area for Growing Stock
for Regulated Types

Stand Size Class	Lodgepole Pine Type				Spruce-Fir Type	
	Forest Survey Area		Area Adjusted to Reflect Growing Stock		Forest Survey Area	
	Acres	Percent	M Acres	Percent	Acres	Percent
Sawtimber	170,545	37	171	37	110,075	75
Poletimber	257,048	55	162	35	28,563	20
Seedling-Sapling	30,196	7	30	7	2,528	2
Nonstocked	3,310	1	98	21	4,266	3
Total	461,099	100	461	100	145,432	100

Growth and Mortality

Growth and mortality are based on Forest Survey data. The calculation is explained under "Supporting Data". Table 11 shows the growth and mortality for the sawtimber types. The total annual net growth for all sawtimber types, based on the past 10 years, is +7.85 board feet per acre and the mortality is 31.36 board feet per acre.

The annual net growth for the spruce-fir sawtimber type is -25.92 board feet per acre.

The expanded growth and mortality for the entire sawtimber type is:

Annual Gross Growth	11,183 M B.F.
Annual Mortality	8,944
Annual Net Growth	2,239 M B.F.

Although empirical yield tables are not available, a potential growth of from 100 to 200 board feet per acre can be expected after the stands have been put under management.

Mortality in general is due largely to disease. Most of the sawtimber stands are past the pathological rotation age. Losses from insects are comparatively light. There has been little or no loss from Engelmann spruce bark beetle.

Prior to the end of this 10-year planning period the growth and mortality will be re-examined. If there are any great changes, the adjustment period will be revised accordingly.

Calculation of Allowable Cut

Lodgepole Pine Sawtimber Type

There are 170,545 acres of lodgepole pine sawtimber type within the working circle. Most of this timber is overaged. The current periodic annual net growth per acre is +30.25 board feet in trees 11.0" d.b.h. and larger and +6.65 cubic feet in trees 5.0" d.b.h. and larger. The average annual mortality per acre is 19.19 board feet in trees 11.0" d.b.h. and larger and 8.53 cubic feet in trees 5.0" d.b.h. and larger. Considering the general age of the type, the annual net growth can be expected to decrease. A 40-year adjustment period will be used to convert the wild stands to managed stands. This will put the area in good growing condition by the year 2000 A.D. Inoperable area, for the type as a whole, is estimated to be five percent. The allowable cut has been discounted to take this into consideration.

Table 11

Summary of Annual Growth and Mortality
For Sawtimber Types
Based on Past 10 Years

Types	Area	Bd.Feet in Trees 11.0" dbh and larger					Cubic Feet in Trees 5.0" dbh and larger				
		Per Acre			Total Annual		Per Acre			Total Annual	
		Gross Growth	Mortality	Net Growth	Net Growth	Total Annual Mortality	Gross Growth	Mortality	Net Growth	Net Growth	Total Annual Mortality
	Acres	BF	BF	BF	MBF	MBF	CF	CF	CF	MCF	MCF
Douglas-fir Ponderosa Pine	4,449	26.24	41.86	-15.62	-69	186	10.28	8.57	+1.71	8	38
Lodgepole Pine	170,545	49.44	19.19	+30.25	+5,159	3,273	15.18	8.53	+6.65	1,134	1,455
Spruce-Fir	110,075	23.86	49.78	-25.92	-2,853	5,480	10.33	17.46	-7.13	-785	1,922
Hardwoods	88	75.30	53.84	+21.46	+2	5	46.45	13.24	+33.21	3	1
Total	285,157	39.21	31.36	+7.85	+2,239	8,944	+13.24	11.98	+1.26	+360	3,416

The allowable cut in area and volume is shown in Table 12 for each 10-year period. An equal volume of timber to be cut was set up for each 10-year period, and the area was then adjusted to reflect this volume.

The annual allowable cut for the lodgepole pine sawtimber type for this 10-year planning period, based on the tabulation method is:

Area -		4,300 acres	
Volume		33,500 M B.F.	Scribner Dec. C Log Rule
	or	41,700 M B.F.	International 1/4" Log Rule
	or	10,226 M C.F.	Cubic Feet

This compares favorably with other methods of area calculations.

a. Kemp formula:

$$\frac{171,000 \times 7 + 162,000 \times 5 + 30,000 \times 3 + 98,000}{4 \times 120} = 4,573 \text{ acres per year}$$

4,573 acres less 5% for inoperability x 7,873.95 b.f. = 34,207 M B.F. per year.

b. Straight area calculation based on a rotation of 120 years,

$$\frac{461,099}{120} = 3,842 \text{ acres}$$

3,842 acres less 5% for inoperability x 7,873.95 b.f. = 28,739 M B.F. per year.

c. A straight area calculation based on harvesting the 170,545 acres of sawtimber during a 40-year adjustment period,

$$\frac{170,545}{40} = 4,264 \text{ acres per year}$$

4,264 acres less 5% x 7,873.95 b.f. = 31,896 M B.F. per year

The volume to be cut from the 4,300 acres of the lodgepole pine sawtimber type is obtained by applying the average volume per acre as shown in Stock and Stand Table 19 and adding net growth calculated at the midpoint for the 10-year period. The following shows the volume to be cut broken down by species within the type. This is based on Scribner Dec. C Log Rule and is for trees 9.0" d.b.h. and larger in the sawtimber type.

Table 12

Allowable Cut - Area and Volume by 10-Year Periods
Based on Present Rate of Growth

10-Year Period	Type and Stand Size Class	Area	Bd. Foot Volume Per Acre			Total Volume	Cubic Foot Volume Per Acre			Total Volume
			Present	Net Growth	Total		Present	Net Growth	Total	
					MMBF					MMCF
1st	Lodgepole Pine:									
	Sawtimber	43,000	7,722.70	151.25	7,873.95	335				
	Poletimber	75,000					1,044.99	100.04	1,145.03	85.5
	Spruce-Fir									
	Sawtimber	22,600	11,433.52	-129.60	11,303.92	256				
2nd	Lodgepole Pine:									
	Sawtimber	41,000	7,722.70	453.75	8,176.45	335				
	Poletimber	64,500					1,044.99	300.13	1,345.12	85.5
	Spruce-Fir									
	Sawtimber	23,200	11,433.52	-388.80	11,044.72	256				
3rd	Lodgepole Pine:									
	Sawtimber	40,000	7,722.70	756.25	8,478.95	335				
	Poletimber	55,500					1,004.99	500.22	1,545.21	85.5
	Spruce-Fir									
	Sawtimber	23,800	11,433.52	-648.00	10,785.52	256				
4th	Lodgepole Pine:									
	Sawtimber	38,000	7,722.52	1,058.75	8,781.45	335				
	Poletimber	49,000					1,044.99	700.31	1,745.30	85.5
	Spruce-Fir									
	Sawtimber	24,400	11,433.52	-907.20	10,526.32	256				
Total										
	Lodgepole Pine:									
	Sawtimber	162,000								
	Poletimber	244,000								
	Spruce-Fir									
	Sawtimber	94,000								

Species	Percent of Volume	Volume M B.F.
Lodgepole Pine	83.75	28,056
Engelmann Spruce	9.19	3,079
Subalpine Fir	6.24	2,090
Aspen	0.44	147
Limber Pine	0.36	121
Douglas-fir	0.02	7
Total	100	33,500

In addition to the above volume, the stock and stand table shows a volume of 533.88 cubic feet per acre in trees 5.0" - 8.9" d.b.h. This volume is considered unmerchantable for sawtimber but would be available for small round wood products including pulpwood. This is referred to as the residual stand after clear cutting for sawtimber.

The total volume available for cutting per year would be:

4,300 acres x 533.88 c.f. = 2,296 M C.F.

Spruce-Fir Sawtimber Type

There are 110,075 acres of spruce-fir sawtimber type within the working circle. Eighty-five percent, or 94,000 acres, is considered operable at this time. Most of the timber is overaged. The current periodic annual net growth is a minus 25.92 board feet per acre and the annual mortality is 49.78 board feet per acre for trees 11.0" d.b.h. and larger. The annual net growth for trees 5.0" d.b.h. and larger in this type is minus 7.13 cubic feet and the mortality is 17.46 cubic feet per acre. This, expanded for the entire type, gives a total annual mortality of 5,480 M B.F. and a net annual loss of 2,853 M B.F. The reliability of the growth data may be questionable. It is, however, the only data available at this time.

The overall objectives call for putting the area in good growing condition by the year 2000 A.D. This will mean harvesting the overmature timber during the next 40 years. A 40-year adjustment period will, therefore, be used to determine the allowable cut for this planning period. A longer period could not be justified with the current mortality.

The mortality and growth will be re-examined prior to the end of this 10-year period. If a material change is found in the annual net growth, the adjustment period may be changed accordingly.

After the 40-year period there will be a considerable decrease in the allowable cut since 75 percent of the area is scheduled for cutting during the 40 years. There is no other alternative, without losing a large part of the timber by mortality.

The allowable cut in area and volume is shown in Table 12 for each 10-year period of the 40 years. An equal volume of timber to be cut was set up for each 10-year period. The area was then adjusted to reflect the volume.

The annual allowable cut for this planning period for the spruce-fir sawtimber type, based on the tabulation method is:

Area		2,260 acres
Volume		25,600 M B.F., Scribner Dec. C Log Rule
	or	28,747 M B.F., International 1/4" Log Rule
	or	5,985 M C.F., Cubic Foot

This compares with other area calculations as follows:

a. Kemp formula:

$$\frac{110,075 \times 7 + 28,563 \times 5 + 2,528 \times 3 + 4,266}{4 \times 140} = 1,652 \text{ acres per year.}$$

1,652 acres less 15% for inoperability x 11,303.92 b.f. = 15,873 M B.F. per year.

b. Straight area calculation based on a rotation of 140 years:

$$\frac{145,432}{140} = 1,039 \text{ acres per year}$$

1,039 acres less 15% for inoperability x 11,303.92 b.f. = 9,983 M B.F. per year.

c. A straight area calculation based on harvesting the 94,000 acres of operable sawtimber stand in 40 years:

$$\frac{94,000}{40} = 2,350 \text{ acres per year}$$

2,350 acres less 15% for inoperability x 11,303.92 b.f. = 22,580 M B.F. per year.

The volume to be cut from the 2,260 acres of the spruce-fir sawtimber type is obtained by applying the average volume per acre as shown in Stock and Stand Table 23, and adding the net growth calculated at the midpoint for the 10-year period. The following shows the volume allowable cut broken down by species within the type. This is based on Scribner Dec. C Log Rule and is for trees 9.0" d.b.h. and larger in the sawtimber type.

Species	Percent of Volume	Volume M B.F.
Engelmann Spruce	71.22	18,232
Subalpine Fir	19.55	5,005
Lodgepole Pine	8.17	2,092
Aspen	1.00	256
Limber Pine	0.06	15
Total	100	25,600

Lodgepole Pine Poletimber Type

There is very little demand for sub-sawlog timber at this time. However, such is expected to materialize during the planning period. The lodgepole pine poletimber size type is, therefore, put under regulation in order to give an estimate as to what volume would be available for cutting.

Ninety-five percent, i.e., 244,000 acres of the total 257,048 acres of the poletimber type is considered operable.

Overall objectives call for putting the area in good growing condition by the year 2000 A.D. This will require converting the type from wild to managed stands during the next 40 years.

The cutting practice for the type will be to commercially thin those stands that are likely to grow into sawtimber size and to clear cut and regenerate the remainder of the type.

The percentage of the type to be thinned and clear cut is shown in Table 9. This amounts to 63 percent or 154,000 acres to be thinned and 37 percent or 90,000 acres to be clear cut.

The current periodic annual net growth is 29.21 cubic feet per acre. The annual mortality is 2.05 cubic feet per acre.

Table 12 gives the allowable cut by area and volume, based on the tabulation method for each 10-year period.

Area	7,500 acres per year
Volume	8,550 M C.F. per year

The volume to be cut from the 7,500 acres of the lodgepole pine poletimber size type is obtained by applying an adjusted average volume per acre taken from Stock and Stand Table 22. The adjustment was based on the percentage to be clear cut and thinned. The net growth was calculated at the midpoint of the 10-year period.

The following shows the volume allowable cut broken down by species and is for trees 5.0" d.b.h. and larger to a 4.0" top d.o.b.

Species	Percent of Species	Volume M C.F.
Lodgepole Pine	92.46	7,905
Engelmann Spruce	2.61	223
Subalpine Fir	2.42	207
Aspen	1.13	97
Limber Pine	0.77	66
Douglas-fir	0.61	52
Total	100	8,550

Volume from rethinned area is not included in the calculation since there will be no re-entry into thinned areas during this planning period.

Calculation of Volume to be Cut from Regulated Area Based on International 1/4" Log Rule and Cubic Feet.

Lodgepole Pine Sawtimber Type. International 1/4" Log Rule.

The average volume per acre is taken from NFA Table 6 and 7 in the IBM binder for volume stratums 3 and 4 and weighted by percent of area in each volume stratum. This is summarized as follows:

	Average Volume Per Acre, Board Feet	
DBH Class	V.S. 3	V.S. 4
9.0-10.9"	3,641.90	2,490.55
11.0" plus	12,208.25	4,924.92
Total	15,850.15	7,415.47
Weight	.2491	.7509

Weighted average	9,516.55 bd. ft.
Net growth taken at midpoint for 10-year period	181.50 bd. ft.
Total	9,698.05 bd. ft.

The growth was determined by taking 120 percent of the growth shown in Scribner Dec. C Table 12. The weighted difference between Scribner Dec. C and International 1/4" Log Rules as based on volumes for the type as shown in NFA Table 6 is 120 percent.

The total volume available for cutting is 4300 acres (Table 12) x 9,698.05 bd.ft. = 41,700 M B.F. per year.

The cubic foot volume for lodgepole pine sawtimber type is taken from Stock and Stand Table 20. To this is added growth from Table 11 extended to the midpoint of the periods.

Current volume	2,344.87	cubic	ft./	acre
Net growth	33.25	"	"	"
Total	2,378.12	"	"	"

The total volume is (4,300 acres x 2,378.12 C.F.) 10,226 M C.F. per year.

Spruce-Fir Type. International 1/4" Log Rule

The average volume per acre is taken from NFA Tables 6 and 7 for Volume Stratums 11, 12, 13, and 14 and weighted by the percent of area in each volume stratum. This is summarized as follows:

DBH Class	Average Volume Per Acre - Board Feet			
	V.S. 11	V.S. 12	V.S. 13	V.S. 14
9.0"-10.9"	312.00	3,432.00	1,717.12	1,080.27
11.0" plus	35,005.19	16,596.66	17,472.45	6,008.04
Total	35,317.19	20,028.66	19,189.57	7,088.31
Weight	.0087	.0023	.4545	.5345

Weighted Average	12,863.69	b.f.
Net Growth	-143.86	
Total	12,719.83	b.f.

The growth was determined by taking 111 percent of the net growth in Scribner Dec. C shown in Table 12 for the first 10-year period. NFA Table 6 shows the converting factor between Scribner Dec. C and International 1/4" Log Rule to be 111 percent for this type. The total volume available for cutting is (2,260 acres x 12,719.83 b.f.) 28,747 M B.F. per year.

The cubic foot volume for the spruce-fir sawtimber type is taken from Stock and Stand Table 24. To this is added growth from Table 11 extended to the midpoint of the period.

Current volume	2,683.75 cubic feet
Net growth	-35.65
Total	2,648.10 cubic feet per acre

The total volume is (2,260 acres x 2,648.10) 5,985 M C.F. per year.

Allowable Cut Beyond the 40-Year Adjustment Period

It is estimated that the distribution of stand size classes at the end of the adjustment period for the two major types will be as follows:

Stand Size Class	Lodgepole Pine M Acres	Spruce-Fir M Acres
Sawtimber	154	25
Poletimber	110	3
Seedling-Saplings	140	85
Nonstocked	34	11
Total	438	124

The above estimates used in the Kemp formula gives an allowable cut as follows:

Lodgepole Pine

$$\frac{154{,}000 \times 7 + 110 \times 5 + 140 \times 3 + 34}{4 \times 120} = 4{,}338 \text{ acres per year}$$

This would indicate that there would be no reduction in the lodgepole pine allowable cut after the adjustment period. An acceptable distribution of age classes would then be obtained by the end of the first rotation.

Pulpwood would come from intermediate cutting in the lodgepole pine type after the adjustment period. With an expected rate of growth of one cord per acre per year in the poletimber type there should be an increase in sub-sawlog size material for pulpwood.

Spruce-Fir Type

$$\frac{25{,}000 \times 7 + 3{,}000 \times 5 + 85{,}000 \times 3 + 11{,}000}{4 \times 140} = 814 \text{ acres per year}$$

This would indicate that the allowable cut for spruce-fir would be reduced to one-third of the current allowable cut after the end of the adjustment period. An acceptable distribution of age classes should be obtained during the second rotation.

Calculation of Unregulated Cut

Douglas-fir-- Ponderosa Pine Sawtimber Type

There are 4,449 acres of Douglas-fir and ponderosa pine sawtimber with an average volume of 2,625.44 board feet per acre. This gives a total of 11,681 M B.F. available for cutting. This should be cut prior to the end of the adjustment period. This timber will be scheduled for cutting with the adjacent regulated type. Timber cut in this type will not be charged against the regulated cut.

Aspen

There are 54,610 acres of large poletimber size stands of aspen in the working circle. The average volume per acre is 2,296.65 cubic feet in trees 5.0" d.b.h. and larger. Aspen constitutes 82.26 percent of the volume with the remainder in associated softwoods, largely lodgepole pine. The total volume in the type is 70,809 M C.F.

Since no market is anticipated for aspen, at least in the near future, the type is not being regulated. An allowable cut for the type will be calculated whenever a market is developed. Until such a time, timber cut from the type will not be charged against other allowable cuts for the working circle.

Cutting Budget

The cutting budget for this period is shown in Table 13. Selection of compartments in which cutting is scheduled was based on the age and condition of the sawtimber stands. The areas are also distributed over the working circle and are within reasonable hauling distances of established sawmills. This schedule will permit an orderly harvesting of the working circle.

A cutting budget for the lodgepole pine poletimber type will not be set up until a market for this size material has developed.

TABLE 13

CUTTING BUDGET
FY 1962 - 1971

Compartments Listed in Priority Sequence

No.	Compartment Name	Ranger District	Lodgepole Pine Sawtimber Type: Area in Acres Gross	Lodgepole Pine Sawtimber Type: Area in Acres Net	Lodgepole Pine Sawtimber Type: Volume MBF	Spruce-Fir Sawtimber Type: Area in Acres Gross	Spruce-Fir Sawtimber Type: Area in Acres Net	Spruce-Fir Sawtimber Type: Volume MBF	Total Volume MBF
		TIMBER UNDER CONTRACT BUT UNCUT AS OF JANUARY 1, 1960							
2	Carlson Cr.	Bow River	1,100	630	4,960	1,000	570	6,443	11,403
31	Hans Cr.	Foxpark	1,653	1,102	8,677	413	274	3,097	11,774
23	Anderson Cr.	Foxpark							
70	Middle French	Brush Creek							
82	Shawnee	Foxpark	5,640	5,640	44,410	2,260	2,260	25,548	69,958
81	Silver Lake	Foxpark							
55	Coe's Cabin	Brush Creek							
54	Cathedral Rock	Brush Creek	2,585	1,940	15,275	2,115	1,200	13,565	28,840
59	E. Fk. Bow R.	Brush Creek							
52	Bow River	Bow River							
90	Turpin Creek	Bow River	9,600	3,840	30,237	5,400	2,160	24,416	54,653
63	Heather	Encampment	300	300	2,362	100	100	1,130	3,492
71	No. Beaver Cr.	Encampment	1,600	1,100	8,661	--	--	--	8,661
51	Big Creek	Encampment	520	410	3,228	--	--	--	3,228
47	Upper Douglas	Foxpark	1,300	1,200	9,449	300	200	2,261	11,710
	Total		24,298	16,162	127,259	11,588	6,764	76,460	203,719

(continued on following page)

Table 13 (continued)

CUTTING BUDGET
FY 1962 - 1971

Compartments Listed in Priority Sequence

No.	Compartment Name	Ranger District	Lodgepole Pine Sawtimber Type Area in Acres Gross	Lodgepole Pine Sawtimber Type Area in Acres Net	Lodgepole Pine Sawtimber Type Volume MBF	Spruce-Fir Sawtimber Type Area in Acres Gross	Spruce-Fir Sawtimber Type Area in Acres Net	Spruce-Fir Sawtimber Type Volume MBF	Total Volume MBF
			TIMBER TO BE OFFERED FOR SALE FY 1962 - 1971						
8	Jim Creek	Centennial	3,842	753	5,929	2,372	377	4,262	10,191
12	Mill Creek	Centennial	1,979	790	6,220	865	395	4,465	10,685
29	Fox Creek	Foxpark	1,997	1,997	15,724	--	--	--	15,724
63	Heather Creek	Encampment	513	128	1,008	1,349	675	7,630	8,638
44	Smith North	Foxpark	645	645	5,079	35	35	396	5,475
51	Big Creek	Encampment	4,029	327	2,575	2,606	200	2,261	4,836
16	Rock Creek Park	Centennial	3,734	2,240	17,639	4,071	2,035	23,003	40,642
14	No. Fork Rock Cr.	Centennial	3,791	2,274	17,905	2,880	1,440	16,278	34,183
4	Deep Creek	Bow River	1,839	1,103	8,685	2,679	1,340	15,147	23,832
71	No. Beaver	Encampment	2,592	342	2,693	735	--	--	2,693
46	Squirrel Creek	Foxpark	1,473	1,473	11,598	--	--	--	11,598
91	Upper No. Mullen	Foxpark	2,643	1,453	11,441	2,389	1,194	13,497	24,938
88	South Mullen	Foxpark	1,880	1,034	8,142	269	134	1,515	9,657
79	Pass Creek	Bow River	3,894	2,141	16,858	2,250	1,125	12,717	29,575
80	Rankin Creek	Bow River	1,165	641	5,047	584	292	3,301	8,348
25	Devil's Gate	Foxpark	2,266	1,246	9,811	424	212	2,396	12,207
39	Muddy Creek	Foxpark	2,654	2,654	20,898	162	162	1,831	22,729
77	No. Savery	Encampment	834	459	3,614	--	--	--	3,614

(continued on following page)

Table 13 (continued)

CUTTING BUDGET
FY 1962 - 1971

Compartments Listed in Priority Sequence

No.	Compartment Name	Ranger District	Lodgepole Pine Sawtimber Type: Area in Acres Gross	Lodgepole Pine Sawtimber Type: Area in Acres Net	Lodgepole Pine Sawtimber Type: Volume MBF	Spruce-Fir Sawtimber Type: Area in Acres Gross	Spruce-Fir Sawtimber Type: Area in Acres Net	Spruce-Fir Sawtimber Type: Volume MBF	Total Volume MBF
			TIMBER TO BE OFFERED FOR SALE FY 1962 - 1971						
65	Jack Creek	Encampment	3,537	1,945	15,315	1,149	574	6,488	21,803
102	White Swan	Foxpark	2,030	2,030	15,984	884	884	9,993	25,977
41	Ropers	Foxpark	1,329	1,329	10,464	--	--	--	10,464
86	S. Fork Miner	Encampment	210	116	913	2,477	1,238	13,994	14,907
33	Illinois Creek	Foxpark	1,602	1,602	12,614	7	7	79	12,693
66	Lake Creek	Brush Creek	959	527	4,150	80	40	452	4,602
73	No. Cedar	Brush Creek	496	273	2,150	398	199	2,249	4,399
85	So. Cedar	Brush Creek	1,972	1,085	8,543	1,190	595	6,726	15,269
60	E. Fork Pass Cr.	Bow River	2,170	1,194	9,401	192	96	1,085	10,486
35	Lake Mountain	Foxpark	1,630	1,630	12,834	48	48	542	13,376
64	Hog Park	Encampment	1,596	798	6,283	3,216	1,608	18,177	24,460
69	Lower Encampment	Encampment	4,779	2,389	18,811	2,778	1,389	15,701	34,512
56	Coon Creek	Encampment	5,192	2,596	20,441	3,754	1,877	21,218	41,659
76	North Mullen	Foxpark	1,176	588	4,630	231	115	1,300	5,930
28	Dave-Elk Creek	Foxpark	1,768	1,237	9,740	518	363	4,103	13,843
	Total		72,216	41,039	323,139	40,592	18,649	210,806	533,945

TRANSPORTATION

Road Program to Meet the 10-Year Cutting Budget

The road survey and construction program for the 10-year period has been scheduled in Table 14. This schedule is correlated with the cutting budget shown in Table 13.

Timber purchaser construction or a combination of purchaser and Forest Service construction will be required for the larger timber offerings. This is necessary since Government funds are not adequate for the construction of all timber access roads.

All roads listed in Table 14 are primarily for the purpose of timber access. Where heavy all-purpose use following completion of the timber hauling is anticipated, bridges and other improvements will be constructed initially to meet eventual all-purpose needs. Financing of such extra cost improvements will be from all-purpose funds.

Right-of-Way Needs

Rights-of-way will be obtained sufficiently in advance of road construction to avoid delay in construction. Action to obtain rights-of-way will be taken in accordance with the road program shown in Table 14.

ROADS NEEDING RIGHT-OF-WAY ACTION

Road No.	Name	Year Action Required
1030	Blackhall Mtn.	1963
1050	Troublesome	1965

Table 14

TIMBER ACCESS ROAD DEVELOPMENT PROGRAM
FY 1962 - 1971

Compartment		Road		Estimated Length in Miles	Estimated Volume Served by Road - MMBF	Estimated Cost	To be built by FS = For. Ser. O = Operator	Road Standard	Current Survey Status
Name	No.	Name	No.						
Middle French	70	North French	1139	6.2	40.0	59,000	0	SN	Complete 1961
East Fork Bow	59	North Brush	1051	1.5	54.0	18,750		SN	Complete 1960
River Turpin	52	Sand Lake	1077	2.0		23,000			
Creek	90						0		
Middle French	70	Barrett Rdg.	1138	1.0	100.0	8,000	0	SN	Complete 1961
Bow River	52	Still Water Park	1078	2.0	30.0	16,000	0	SN	Complete 1960
Carlson Creek	2	Arlington Road	1087	1.5	40.7	12,000	0	SN	Complete 1960
Jim Creek	8	Mullen Cr.	1258	1.0	55.0	4,000	0	SN	Complete 1961
Middle French	70								
Shawnee	82	South French	1137	13.6	96.1	208,000		SN	Complete 1962
Silver Lake	81						0		
Smith-North	44	Smith-North	1150	5.5	6.4	60,000	0	SN	Survey & Const. needed FY 1961
Heather Cr.	63	Shingle Cr.	1302	2.0	12.8	20,000	0	SL	Complete 1961
Rock Cr. Park	16	Rock Cr. Patrol	1091	6.0	70.7	60,000		SH	)
		Rock Cr. Knoll	1084	2.6		33,000		SH	)Survey needed FY 1961
		Hall	1234	3.0		30,000		SH	)Const. " " "
		Trail Creek	1082	5.0		50,000	0	SH	)
		Rock Cr. Circle	1328	2.5		25,000		SH	Complete Survey 1961
East Fork Pass	60	East Fork Pass	1058	6.0	10.4	60,000	0	SH	Survey 1963, Const. 1964

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Table 14 (Continued)

TIMBER ACCESS ROAD DEVELOPMENT PROGRAM
FY 1962 - 1971

Compartment		Road		Estimated Length in Miles	Estimated Volume Served by Road - MMBF	Estimated Cost	To be built by: FS = For. Serv. O = Operator	Road Standard	Current Survey Status
Name	No.	Name	No.						
Upper N.Mullen		Headquarters	1109	6.4	62.3	68,000	0	SH	Survey 1959;Const.1961
S. Mullen	88	S. Mullen	1108	7.0	19.4	70,000	0	SH	Survey 1961;Const.1961
S. Fork Minor	86	Willow Park	1024	6.0	23.4	60,000	0	SH	Survey 1961;Const.1962
Pass Creek	79	Pass Creek	1060	5.0	69.9	50,000	0	SH	Survey 1962;Const.1963
Rankin Creek	79	Cedar Pass	1048	9.0	88.1	100,000	0	SH	Survey 1962;Const.1963
Devils Gate	25	Devils Gate	1149	8.0	48.9	66,000	0	SH	Survey 1961;Const.1961
White Swan									
N. Savery	77	Little Jack Cr.	1001	10.0	7.8	100,000	0	SH	Survey completed 1958;
Jack Creek	65	Hansen Cr.	1000	9.2	39.0			SH	Const. 1963
Hog Park	64	North Fork	1023	6.0	35.4	60,000	0	SH	Survey 1966
	64	Hog Park	1246	11.5		18,000	0	SH	Const. 1967
Coon Creek	56	Commissary Park	1034	12.3	93.7	120,000	0	SH	Survey 1964
	56	Coon Cr.	1039	5.0		50,000	0	SH	Const. 1965
Lower Encampment	69	Rim	1031	20.5	64.7	250,000	0	SH	Sur.1962;Const.1963-64
	69	Blackhall Mtn.	1030	9.6		(Right-of-way & construction by County)			
	69		1032	5.4		50,000	0	SH	Sur.1963;Const.1964-65
N. Beaver	71	Camp Creek	1035	4.0	29.1	40,000	0	SH	Sur.1968;Const.1969

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Table 14 (Continued)

TIMBER ACCESS ROAD DEVELOPMENT PROGRAM
FY 1962 - 1971

Compartment		Road		Estimated Length in Miles	Estimated Volume Served by Road - MMBF	Estimated Cost	To be built by: FS = For.Serv. O = Operator	Road Standard	Current Survey Status
Name	No.	Name	No.						
Big Creek	51	Coon Creek	1039	6.0	62.9	60,000	FS O	SH	Survey needed) FY 1961 Const. needed)
Lake Creek	66	Cumberland Gulch	1049	9.4	9.9	101,000	O	SH	Survey 1962;Const.1963
N. Cedar Creek	73	Cedar Pass	1048	12.0	11.2	180,000	O	SH	Survey 1963;Const.1964
S. Cedar Creek	85	Troublesome	1050	5.0	35.6	50,000	O	SH	ROW action needed in FY 1964
Illinois Creek	33	Park Run	1146	8.1	11.8	81,000	O	SH	Survey 1963;Const.1964
White Swan	102	Flume Cr.	1331	2.0	14.2	20,000	O	SH	Survey 1961;Const.1961
Muddy Creek	39	Dry Park	1116	4.5	20.4	45,000	O	SH	Survey 1965;Const.1966
Lake Mountain	35	Lake Mtn.	1115	2.4	11.5	24,000	O	SH	Survey 1967;Const.1968
Squirrel Cr.	46	Cut Off	1162	3.0	11.6	30,000	O	SH	Survey & Const.
		Squirrel Cr.	1112	2.5		20,000	O	SH	needed - FY 1962
Mill Creek	12	Middle Fork Mill Cr.	1099	2.5	9.0	25,000	O	SH	1961 Const.
N. Fork Rock Creek	14	N. Fork Canyon	1081	4.0	60.3	40,000	O	SH	Survey 1964;Const.1965
Deep Creek	4	Deep Lake	1233	5.5	42.7	55,000		SH	Survey 1963
		Crater Lake	1226	5.2		52,000	O	SH	Const. 1964
Dave-Elk Cr.	28	Slab Pile	1106	1.0		10,000	O	SH	Survey 1962 Const. 1963

SALES POLICY

There is sufficient established plant capacity in the working circle to utilize the allowable cut of sawtimber. Each mill should have three to five years' supply of timber under contract. Since the average requirements of the various mills range from less than a million board feet to more than 30 million board feet per year, the size of the offerings will vary.

The guide for sale size is:

1. For mills cutting 10 million board feet or more per year, sales should be for 30 to 100 million feet, more or less.

2. For mills cutting three to eight million board feet per year, offering should be from 10 to 20 million board feet.

3. For mills having a smaller requirement, offering will be from one to five million board feet.

Points of Manufacture

At the present time, logical points for lumber manufacturing are Saratoga, Foxpark, Rock River, Laramie, Centennial, Encampment and Baggs. Timber will be appraised to one of these points. The point selected for a particular sale will normally be that of greatest advantage to the Government.

Merchantability Specifications

The minimum size sawtimber tree in lodgepole pine is 8.0 to 10.0 inches d.b.h. to a six inch top, d.i.b. In other species the minimum size tree is 10.0 inches d.b.h. to an eight inch top, d.i.b.

The stump height for sawtimber is 12 inches. An eight inch stump height is used for pole size trees.

Logging Methods

1. Lodgepole Pine

   Use of tractors or animals for skidding is acceptable. When tractors are used, maximum allowable size without authorization in writing is D-7 or equivalent.

   The presale prescription will specify permissible logging methods for each sale.

2. Spruce-Fir

The same classes of logging equipment may be used in this type as in lodgepole pine. The potential for build-up of Engelmann spruce bark beetle populations in this type will require special considerations, such as disposal of cull and slash material of large size. Complete slash disposal, entire-tree skidding with slash and cull disposal at the landing, or other such method will be considered for approval on an individual case basis.

STAND IMPROVEMENT

1. Reforestation Survey

The 1957 timber inventory indicates that 7,576 acres of commercial forest land in the working circle are nonstocked and 2,197 acres in the seedling-sapling type are poorly stocked. At the time of the inventory, part of this area contained reproduction smaller than the 1/2-foot minimum height considered in the survey. Also, the degree of understocking and the condition of poorly stocked stands were not considered. Prior to making a detailed reforestation plan, therefore, an intensive survey will be made of these areas to determine actual planting needs. This will be accomplished by FY 1963.

2. Planting

Pending completion of the reforestation survey described above, 50 percent of the area classed by the timber inventory as nonstocked and as poorly stocked seedling-sapling stands will be considered as needing planting.

In the lodgepole pine sawtimber type, natural reproduction following logging usually is adequate. Accordingly, it is estimated that planting will be needed on only three percent of the type area following cutting.

In the spruce-fir sawtimber type, natural reproduction is often adequate, but to provide prompt and satisfactory stocking planting of a minimum of 300 Engelmann spruce trees per acre as soon as practicable after logging is considered necessary on an estimated 10 percent of the cutover area.

3. Measures to Aid or Control Natural Regeneration

In the spruce-fir type, logging and slash disposal methods will be used, where practicable, which will result in an improved seedbed to aid natural regeneration. The selection of methods to be applied will also consider the needs of insect control.

In the lodgepole pine type, slash disposal methods will be varied as necessary to aid in controlling the amount and distribution of reproduction.

4. Thinning

a. Noncommercial

Thinning of new growth in lodgepole pine will be done on 20,000 acres of lodgepole pine type currently cut over during the 10-year period. This will be accomplished with sale area betterment deposits.

In addition, noncommercial thinning using P&M funds, will be done in this period on 5,000 acres out of 15,712 acres of overstocked seedling-sapling stands.

b. Commercial

Commercial thinning of lodgepole pine pole stands will be done on 3,000 acres during the current period through small sales of posts and poles.

The total commercial thinning job amounts to 162,000 acres. Substantial accomplishment in this job will be made when a pulpmill or other large industry is established to utilize small, round material. Industry establishment is planned for the end of the present 10-year period.

Table 15

THE PLANTING JOB - FY 1962 to 1981

Type	Planting Needed on Nonstocked Areas (Acres)	Understocked Seedling-Sapling Stands Needing Regeneration (Acres)	Stagnated Pole Stands to be Clear Cut and Planted (Acres)	Regeneration Needed on Sawtimber Areas Cut Over After FY 1961 (Acres)	Planting to Re-establish Conifers in Aspen (Acres)	Total (Acres)
Lodgepole Pine	1,655	792	94,600	2,580 3/	20,154	119,781
Spruce-Fir	2,133	306	--	4,500 4/	10,077	17,016
Total	3,788 1/	1,098 1/	94,600 2/	7,080	30,231 5/	136,797

1/ Actual planting job to be determined by field examination. For planning purposes, this is estimated at 50% of timber inventory nonstocked and poorly stocked area.
2/ Dependent upon establishing a new industry to utilize small, round products.
3/ Estimated at 3% of the lodgepole pine area to be cut over in current sales.
4/ Planting of a minimum of 300 trees per acre to be done where necessary, as soon as practicable after logging.
5/ Estimated at 50% of the total area of aspen type.
6/ Estimated at 37% of the 10-year total cut of poletimber.

THE PLANTING JOB - FY 1962 to 1971

Type	Planting Needed on Nonstocked Areas (Acres)	Understocked Seedling-Sapling Stands Needing Regeneration (Acres)	Stagnated Pole Stands to be Clear Cut and Planted (Acres)	Regeneration Needed on Sawtimber Areas Cut Over After FY 1961 (Acres)	Planting to Re-establish Conifers In Aspen (Acres)	Total (Acres)
Lodgepole Pine	828	396	2,775	1,290	10,077	15,366
Spruce-Fir	1,066	153	0	2,260	5,039	8,518
Total	1,894	549	2,775 2/ 6/	3,550	15,116	23,884

PROTECTION

Insects

a. Insect Conditions

Bark beetle activity has been light during the past 10 years in lodgepole pine and Engelmann spruce. An increase in activity of the Engelmann spruce bark beetle (Dendroctonus engelmanni) has, however, been noticed on recently logged spruce areas.

The pandora moth (Coloradia pandora) heavily infests about 10,000 acres of lodgepole pine on the Foxpark District. These insects were in the pupal state in the fall of 1959. This infestation will be watched and spray control measures started if advisable.

b. Action Program

To facilitate all insect control and to harvest infested timber, access is essential. This can be favored by continuing the policy of clear cutting 50% to 60% of the area in mature stands, thus extending the road system at about twice the rate as for a complete clear cut.

The planned action for insect control, by timber types, is as follows:

1. Lodgepole pine type: A continuing, carefully administered detection program will be maintained so that potential epidemics can be recognized and controlled.

2. Spruce-fir type: Logging slash, including cull material of such size and species that would harbor spruce bark beetles, will be bunched and burned prior to the emergence of the insect. This may be done by entire tree skidding to centralized bucking yards or by any other method that will bunch the material for burning. New timber sale contracts will provide for such slash disposal requirements. Also, extended contracts and contracts that provide for rate redetermination will be modified to include insect-control requirements of this kind.

Disease

1. The Dwarfmistletoe Control Job

Dwarfmistletoe (Arceuthobium americanum) infects 60% to 70% of the trees in the lodgepole pine type. At this rate, about 275,000 acres of the commercial forest land to be cut over would be infected. Control measures consist of cutting, burning, poisoning or girdling infected trees.

Priority for control work will be given to areas which have been cut over within 15 years, including areas in current timber sale operations. The total job in this category would amount to 138,000 acres, 108,000 acres of which would be on current sales and 30,000 acres on older clear-cut areas.

Stagnated poletimber stands total 36,000 acres. Any appreciable cutting in this area will have to await establishment of new industry utilizing small, round material.

The balance of the infected area is principally that cut over for ties more than 15 years ago and on which partial cutting was done. Treatment of the infected advanced reproduction in such areas is impracticable at the present time. Further research information on dwarfmistletoe may lead to control guidelines for application under these conditions.

2. The 10-Year Control Program

The 10-year control program will involve cutting, poisoning, girdling or burning infected residual stands of five cords per acre or less on current lodgepole pine sale areas. The work on this area, estimated to be 6,000 acres, will be accomplished with timber sale cooperative funds.

On the lodgepole pine areas clear cut within 15 years a survey will be made to determine the extent of infection and the control measures needed. This job will be done by 1965. Pending the completion of the survey, 300 acres of infected residual stand of five cords or less will be treated annually for an estimated total of 1,500 acres. Appropriated funds will be used, as available, for the survey and control work.

Animals

The porcupine control program will be as follows:

1. Instruct employees to kill porcupines seen in course of regular work. Furnish small-bore ammunition to employees for this purpose.

2. Encourage forest users to kill porcupines as a timber conservation measure. Inform the general public of the damage done by porcupines.

Fire

The large area of slash, combined with heavy blowdown of the residual stand on some of the partially cut sale areas, has resulted in a serious fire hazard. The following slash disposal program will be applied for the purpose of reducing the rate of slash area build-up. It will be done on a cost-sharing basis in conjunction with the programs for site preparation and for insect and disease control.

Cutover areas will be classed as:

TYPE I

Heavy Slash (E-H, H-H, H-E) and areas of high possible fire occurrence. Treatment to consist of mechanical treatment or burning designed to eliminate 80% of the logging slash.

Planned Program: 1,200 acres per year.

TYPE II

Medium Slash (M-H and H-M): Treatment to consist of mechanical treatment or burning of slash concentrations designed to eliminate at least 50 percent of the ground fuel.

Planned Program: 3,400 acres per year.

TYPE III

Light Slash (M-M, L-M, M-L): No slash treatment.

Planned Program: 1,100 acres per year.

Guide for classifying cutover areas:

The following is a guide to be used in classifying slash areas into Types I, II and III.

TYPE I - Heavy Slash

1. Almost continuous slash or debris three feet or more in depth, unprotected slopes and slopes over 10% -- lodgepole pine type.

2. Slash piles or debris less than three feet deep with clean breaks more than 100 feet apart, unprotected slopes and slopes over 20% -- lodgepole pine type.

3. Heavy, nearly continuous slash or debris with only narrow breaks, less than 20% of canopy remaining, unprotected slopes and slopes under 10% -- spruce-fir type.

TYPE II - Medium Slash

1. Almost continuous slash or debris three feet or more in depth, flat or generally protected slopes and slopes under 10% -- lodgepole pine type.

2. Slash piles or debris less than three feet deep with clean breaks more than 100 feet apart, protected slopes and slopes under 20% -- lodgepole pine type.

3. Slash piles or debris less than three feet deep with clean breaks less than 100 feet apart, unprotected slopes and slopes over 20% -- lodgepole pine type.

4. Heavy, nearly continuous slash and debris with only narrow breaks, flat or generally unprotected slopes and slopes over 10% -- spruce-fir type.

TYPE III - Light Slash

1. Slash piles or debris less than three feet deep with clean breaks less than 100 feet apart, flat or generally protected slopes and slopes under 20% --lodgepole pine type.

2. Scattered fine fuels from log piles with open canopy, huckleberry cover or bare spots making up 20% or more of the area, on very steep or exposed slopes -- lodgepole pine type.

3. Wet flats or protected slopes with wide, frequent breaks -- spruce-fir type.

In addition to this slash disposal program, extra protection plans will be provided for the areas of light slash which do not receive slash treatment.

ACQUISITION

The forest land exchange plan prescribes the acquisition program. There are no conflicts with the 10-year cutting budget.

SUPPORTING DATA

Compartment Records

Within one year after the approval of this plan a system of compartment records will be set up for each ranger district. This will consist of Form 272-R2 and a map for each compartment within the ranger district. These will be maintained in an atlas-size binder. Form 272-R2 will be posted at least once annually. Since balances may be struck at anytime, the form provides for a continuous inventory of the compartment. Compartment descriptions for at least those compartments scheduled for cutting during the 10-year periods will also be included in the atlas binder. Such descriptions may be made on the back of Form 272-R2.

Timber Inventory

The inventory data on which this plan revision is made was obtained from the Cooperative Forest Survey--Region 2 Inventory Program conducted in 1957.

The inventory was conducted to standards prescribed and agreed to by Forest Survey of the Intermountain Forest and Range Experiment Station, and by the Division of Timber Management, Region 2 (Ref: Field Instruction for Forest Inventory, Rocky Mountain Region 1956). Forest Survey read the plots and processed the data. Region 2 delineated the types on aerial photographs, transferred the types to planimetric maps, printed the final type maps and calculated the area of the types.

Sampling Error

Volume data was based on plots taken at the following number of locations. Two plots were taken at each location.

Type	Stand Size Class	Stocking Class	No. of Locations
Douglas-fir	Sawtimber	all	7
Douglas-fir	Poletimber	all	1
Lodgepole Pine	Sawtimber	medium	22
Lodgepole Pine	Sawtimber	poor	41
Lodgepole Pine	Poletimber	well	12
Lodgepole Pine	Poletimber	medium	16
Lodgepole Pine	Poletimber	poor	3
Lodgepole Pine	Seedling-Sapling	well	2
Lodgepole Pine	Seedling-Sapling	medium	2
Lodgepole Pine	Nonstocked	----	1
Spruce-Fir	Large sawtimber	medium	3
Spruce-Fir	Large sawtimber	poor	1
Spruce-Fir	Small sawtimber	medium	17
Spruce-Fir	Small sawtimber	poor	23
Spruce-Fir	Poletimber	medium	4
Spruce-Fir	Poletimber	poor	8
Spruce-Fir	Seedling-Sapling	medium	1
Spruce-Fir	Seedling-Sapling	poor	2
Spruce-Fir	Nonstocked	----	1
Aspen	Sawtimber	all	2
Aspen	Poletimber	all	10
Aspen	Seedling-Sapling	all	3
TOTAL			182

It was estimated that plots in the above number would give a sampling error per cubic foot volume of not to exceed five percent (one standard error) for the working circle.

There is no sampling error for the determination of area, since such was based upon a 100 percent mapping job.

Data Processing

Forest Survey of the Intermountain Forest and Range Experiment Station processed the data through the IBM Section of the Pacific Southwest Station. This was done in accordance with the "Plan for Compilation of the Intermountain Forest Survey, Rocky Mountain Area by IBM Method" October 1, 1956 by Robert M. Miller.

The NFA Tables are on file in the forest supervisor's office. These are:

Area

NFA 2 - Compartment Area

NFA 3 - Block Area Summary

NFA 4 - Working Circle Area Summary

Volume

NFA 6 and 7 - Average volume per acre by volume stratum

NFA 24 - Average past volume per acre by volume stratum (10 years past).

Miscellaneous Tables - Number of trees per acre and various Forest Survey Summaries.

Copies of the plot tally sheets are on file in the forest supervisor's office.

Aerial photographs on which the photo interpretation was done are on file at the Denver Federal Record Storage Center.

Photographic plates from which the type maps were printed are stored in the Division of Timber Management, Forest Service, Denver, Colorado.

Method for Calculating Periodic Annual Net Growth

Basic data are from Tables NFA 6 and 7 in Forest Survey IBM binder on file in the forest supervisor's office.

Growth and mortality may be calculated for the volume stratum and for species within the volume stratum.

Merchantability Class 1 for each volume stratum in Table NFA 6 gives the present volume.

Merchantability Class 1 for each volume stratum in Table NFA 24 gives the volume 10 years ago.

The difference between the two is the gross 10-year growth.

Mortality is given under Merchantability Class 7 in Table NFA 6. This is for a five-year period.

Mortality divided by five and subtracted from the annual gross growth gives the periodic annual net growth.

Table 16

Average Age and Height by Species
for DBH 2 Inch Classes
Forest Survey Site Trees

Stand Size Class	DBH 2" Class	Lodgepole Pine		Engelmann Spruce		Subalpine Fir	
		Age Years	Height Feet	Age Years	Height Feet	Age Years	Height Feet
Seedling-Sapling	½' ht. to 0.9" dbh	11	2				
	1.0- 2.9	--	--	49	26		
	3.0- 4.9	60	24	32	15	101	54
Poletimber	5.0- 6.9	70	36	56	26	47	24
	7.0- 8.9	98	45	74	38	70	38
	9.0-10.9	122	51	70	37	72	38
Small Sawtimber	11.0-12.9	152	56	171	61	143	59
	13.0-14.9	153	60	227	65	146	59
	15.0-16.9	146	62	174	60	115	90
	17.0-18.9	177	70	199	70		
	19.0-20.9	206	60	203	77		
Large Sawtimber	21.0-22.9			172	71		
	23.0-24.9			250	94		
	25.0-26.9			--	--		
	27.0-28.9			302	94		
	29.0-30.9			475	95		

Table 17

Distribution of Site Trees
By Major Types, Stand Size Classes and Age Classes

Type	Age Class Years	Sawtimber		Poletimber		Seedling-Sapling	
		No. trees	Percent	No. trees	Percent	No. trees	Percent
Lodgepole Pine	1- 19	0	0	0		2	25
	20- 39	0	0	3	5	0	0
	40- 59	1	1	8	14	2	25
	60- 79	7	8	24	41	1	12
	80- 99	7	8	11	19	1	13
	100-119	5	6	3	5	0	0
	120+	63	77	10	16	2	25
Total		83	100	59	100	8	100
Engelmann Spruce	1- 19	0		0			
	20- 39	0		2	17		
	40- 59	1	2	8	67		
	60- 79	7	11	0			
	80- 99	3	5	1	8		
	100-119	5	8	0			
	120-139	3	5	1	8		
	140+	43	69	0			
Total		62	100	12	100		
Subalpine Fir	1- 19	0	0	0	0		
	20- 39	0	0	1	11		
	40- 59	0	0	5	56		
	60- 79	1	7	1	11		
	80- 99	1	8	2	22		
	100-119	1	8	0	0		
	120-139	4	31	0	0		
	140+	6	46	0	0		
Total		13	100	9	100		

Table 18

Average Net Volume Per Acre by Species
And Growth and Mortality

DOUGLAS-FIR SAWTIMBER TYPE

Species	VS-01		Percent of Species Based on	
	BF	CF	BF	CF
Douglas-fir	1,666.70	485.28	63.48	62.19
Ponderosa Pine	735.34	187.78	28.01	24.06
Lodgepole Pine	190.01	39.90	7.24	5.11
Limber Pine	33.39	7.30	1.27	0.94
Aspen	--	60.05	--	7.70
Total	2,625.44	780.31	100	100
Growth and Mortality				
10-Year Gross Growth	262.44	102.87		
10-Year Mortality	418.62	85.74		
Annual Net Growth	-15.61	+1.71		
Area in Volume Stratum Acres	4,358			

Table 19

Average Net Volume Per Acre By Species and Crown Density Classes
and
Growth and Mortality By Crown Density Classes
for
LODGEPOLE PINE SAWTIMBER TYPE

Species	Crown Density Classes						Percent of Species Based on	
	Medium (VS3)		Poor (VS4)		Weighted Average			
	BF	CF	BF	CF	BF	CF	BF	CF
Douglas-fir	7.42	2.50	--	--	1.85	0.62	0.02	0.03
Lodgepole Pine	10,771.76	2,814.20	5,040.10	1,628.49	6,467.87	1,923.85	83.75	82.05
Limber Pine	110.33	36.45	--	--	27.48	9.08	0.36	0.39
Subalpine Fir	588.22	269.37	446.18	152.48	481.56	181.60	6.24	7.74
Engelmann Spruce	1,613.71	370.24	410.16	94.64	709.96	163.29	9.19	6.96
Aspen	24.82	23.65	37.02	80.62	33.98	66.43	0.44	2.83
Total	13,116.26	3,516.41	5,933.46	1,956.23	7,722.70	2,344.87	100.00	100.00
Growth and Mortality								
10-Year Gross Growth	149.55	50.58	608.78	185.39	494.39	151.81		
10-Year Mortality	326.54	124.06	147.28	72.46	191.93	85.31		
Annual Net Growth	-17.70	-7.35	+46.15	+11.29	+30.25	+6.65		
Area in Volume Stratum								
Acres	42,486		128,059		170,545			
Percent	24.91		75.09		100			

Table 20

STOCK AND STAND TABLE

LODGEPOLE PINE SAWTIMBER TYPE

By DBH and Crown Density Classes

Average Per Acre

DBH Classes		Crown Density Classes								
		Medium (VS3)			Poor (VS4)			Weighted Average		
10" Class	2" Class	No. of Trees	Net Volume BF	Net Volume CF	No. of Trees	Net Volume BF	Net Volume CF	No. of Trees	Net Volume BF	Net Volume CF
0	1.0- 2.9	69			184			155		
	3.0- 4.9	90			128			118		
1	5.0- 6.9	68			69			69		
	7.0- 8.9	57		1,326.66	57		1,057.65	57		1,124.66
	9.0-10.9	60	2,721.92		43	1,854.98		47	2,070.93	
2	11.0-12.9	36			25			28		
	13.0-14.9	22			10			13		
	15.0-16.9	11	9,697.92	2,054.92	3	3,959.52	876.32	5	5,388.96	1,169.91
	17.0-18.9	7			2			3		
	19.0-20.9	3			--			1		
3	21.0-22.9	1			--			--		
	23.0-24.9									
	25.0-26.9		489.88	93.79		118.96	22.26		211.36	40.08
	27.0-28.9									
	29.0-30.9									
4	31.0+	--	206.54	41.04		--	--		51.45	10.22
Total		424	13,116.26	3,516.41	521	5,933.46	1,956.23	496	7,722.70	2,344.87

Board foot volume in trees 9.0" d.b.h. and larger.

Cubic foot volume in trees 5.0" d.b.h. and larger.

Table 21

Average Net Volume Per Acre By Species and Crown Density Classes
and
Growth and Mortality by Crown Density Classes
for
LODGEPOLE PINE POLETIMBER TYPE

Species	Crown Density Classes				Percent of Species
	VS5 Well CF	VS6 Medium CF	VS7 Poor CF	Weighted Average CF	
Douglas-fir	--	21.21	--	9.23	00.61
Lodgepole Pine	2,111.75	875.95	432.24	1,410.57	92.46
Limber Pine	--	--	121.51	11.81	00.77
Subalpine Fir	40.03	35.59	27.22	36.85	2.42
Engelmann Spruce	24.13	65.59	--	39.83	2.61
Aspen		39.63		17.25	1.13
Total	2,175.91	1,037.97	580.97	1,525.54	100.00
10-Year Gross Growth	458.81	201.51	106.94	312.61	
10-Year Mortality	8.50	27.94	45.40	20.55	
Annual Net Growth	45.03	17.36	6.15	29.21	
Area in Volume Stratum:					
Acres	120,164	111,893	24,991	257,048	
Percent	46.75	43.53	09.72	100.00	

Table 22

STOCK AND STAND TABLE

LODGEPOLE PINE POLETIMBER TYPE

By DBH and Crown Density Classes
Average Per Acre

DBH Classes		Crown Density Classes											
		Well (VS5)			Medium (VS6)			Poor (VS7)			Weighted Average		
10" Class	2" Class	No. of Trees	Net Volume Cu. Ft.	Basal Area Sq. Ft.	No. of Trees	Net Volume Cu. Ft.	Basal Area Sq. Ft.	No. of Trees	Net Volume Cu. Ft.	Basal Area Sq. Ft.	No. of Trees	Net Volume Cu. Ft.	Basal Area Sq. Ft.
0	1.0- 2.9	334		7.35	484		10.65	--		--	367		8.07
	3.0- 4.9	417		36.28	156		13.57	--		--	263		22.88
1	5.0- 6.9	319		62.90	90		17.64	16		11.56	190		37.24
	7.0- 8.9	125	1,980.75	43.62	62	826.37	21.64	59	459.95	20.59	91	1,330.43	31.76
	9.0-10.9	37		20.16	27		14.72	17		9.26	31		16.90
2	11.0-12.9	7		5.50	8		6.28	3		2.36	7		5.50
	13.0-14.9	3		3.21	1		1.07	2		2.14	2		2.14
	15.0-16.9	--	195.16	--	1	182.48	1.40	1	121.02	1.40	1	182.43	1.40
	17.0-18.9							1		1.77			
	19.0-20.9												
3	21.0+	--	--			29.12		--	--			12.68	
Total		1,242	2,175.91	179.02	829	1,037.97	86.97	99	580.97	49.08	952	1,525.54	125.89

Note: Volume in trees 5.0" d.b.h. and larger.

Table 23

Average Net Volume Per Acre By Species and Crown Density Classes
And Growth and Mortality by Crown Density Classes

SPRUCE-FIR SAWTIMBER TYPE

Species	Crown Density Classes: Large Sawtimber: Medium (VS11) BF	Large Sawtimber: Medium (VS11) CF	Large Sawtimber: Poor (VS12) BF	Large Sawtimber: Poor (VS12) CF	Small Sawtimber: Medium (VS13) BF	Small Sawtimber: Medium (VS13) CF	Small Sawtimber: Poor (VS14) BF	Small Sawtimber: Poor (VS14) CF	Weighted Average BF	Weighted Average CF	Percent of Species Based on BF	Percent of Species Based on CF
Lodgepole Pine	--	--	--	--	1,092.40	236.42	818.54	257.38	934.00	245.02	8.17	9.13
Limber Pine	--	--	--	--	--	--	12.25	2.47	6.55	1.32	0.06	00.05
Subalpine Fir	3,746.57	853.50	6,890.39	1,822.20	2,957.13	1,080.44	1,577.95	565.83	2,235.87	805.12	19.55	30.00
Engelmann Spruce	28,122.79	5,026.87	10,564.91	1,888.11	13,165.92	2,534.75	3,536.04	758.96	8,142.89	1,605.78	71.22	59.83
Aspen	--	--	--	--	--	--	213.67	49.60	114.21	26.51	1.00	0.99
Total	31,869.36	5,880.37	17,455.30	3,710.31	17,215.45	3,851.61	6,158.45	1,634.24	11,433.52	2,683.75	100.00	100.00
Growth and Mortality Per Acre												
10-Year Gross Growth	-1,179.07	-234.93	+478.88	+52.41	+39.02	+39.07	+430.32	+163.59	238.58	103.28		
10-Year Mortality	--	15.90	506.90	104.98	701.18	247.72	332.92	115.28	497.79	174.59		
Annual Net Growth	-117.91	-25.08	-2.80	-5.26	-66.22	-20.86	+9.74	+4.83	-25.92	-7.13		
Area in Volume Stratum												
Acres	959		250		50,030		58,836		110,075			
Percent	00.87		00.23		45.45		53.45		100			

Table 24

STOCK AND STAND TABLE

SPRUCE-FIR SAWTIMBER TYPE

By DBH and Crown Density Classes
Average Per Acre

DBH		Crown Density Classes															
		Large Sawtimber						Small Sawtimber									
		Medium (VS 11)			Poor (VS 12)			Medium (VS 13)			Poor (VS 14)			Weighted Average		
10" Class	2" Class	No. of Trees	Net Volume BF	CF	No. of Trees	Net Volume BF	CF	No. of Trees	Net Volume BF	CF	No. of Trees	Net Volume BF	CF	No. of Trees	Net Volume BF	CF
0	1.0- 2.9	84			--			206			164			182		
	3.0- 4.9	83			250			44			141			97		
1	5.0- 6.9	--			--			55			43			48		
	7.0- 8.9	--		75.90	25		888.52	45		777.46	41		542.17	42		645.85
	9.0-10.9	9	232.01		50	2712.00		29	1373.27		24	826.13		26	1073.97	
2	11.0-12.9	8			21			24			14			19		
	13.0-14.9	11			9			17			11			14		
	15.0-16.9	13	8903.01	1773.87	3	5090.54	1108.73	16	11287.32	2259.01	5	4296.67	901.75	10	7515.82	1526.69
	17.0-18.9	8			10			10			4			7		
	19.0-20.9	11			2			7			2			4		
3	21.0-22.9	5			--			4			1			2		
	23.0-24.9	11			--			1			1			1		
	25.0-26.9	4	15744.88	2825.85	--	4891.53	883.24	2	3946.14	709.74	--	1035.65	190.32	1	2495.31	450.92
	27.0-28.9	7			5			--			--			--		
	29.0-30.9	1			3			--			--			--		
4	31.0-32.9	3			5			--			--			--		
	33.0-34.9	2			--			--			--			--		
	35.0-36.9	1	6989.46	1204.75	--	4761.23	829.82	1	608.72	105.40	--	--		1	348.42	60.29
	37.0-38.9	--			--			--			--			--		
	39.0-40.9	1			--			--			--			--		
Total		262	31869.36	5880.37	383	17455.30	3710.31	461	17215.45	3851.61	451	6158.45	1634.24	454	11433.52	2683.75

GPO 846908

Table 25

Average Net Volume Per Acre By Species
and Growth and Mortality for

ASPEN SAWTIMBER AND POLETIMBER TYPE

Species	Sawtimber V.S. 20				Poletimber V.S.21	Weighted Average	
	Volume Per Acre		Percent of Species Based on		Volume Per Acre	Volume Per Acre	Percent of
	BF	CF	BF	CF	CF	CF	Species
Lodgepole Pine	760.03	451.06	23.15	36.19	172.34	172.79	13.33
Subalpine Fir	--	34.65	--	2.78	54.92	54.89	4.23
Engelmann Spruce	--	--	--	--	2.31	2.31	0.18
Aspen	2,523.00	760.51	76.85	61.03	1,067.13	1,066.64	82.26
Total	3,283.03	1,246.22	100	100	1,296.70	1,296.63	100
Growth and Mortality							
10-Year Gross Growth	753.03	464.55			353.11	353.29	
10-Year Mortality	538.40	132.42			13.80	13.99	
Annual Net Growth	+21.46	+33.21			+33.93	+33.93	
Area in Volume Stratums							
Acres	88				54,522	54,610	
Percent	00.16				99.84		

Table 26

Area, Volume Per Acre, and Total Volume
By Volume Stratum
National Forest Unreserved Lands

Volume Stratum					Volume Per Acre			Total Volume		
No.	Type	Stand Size Class	Stocking Class	No. of Plots	Area Acres	Int. 1/4"	Scrib. Dec. C	Cubic Feet	Int. 1/4"	Scrib. Dec. C	Cubic Feet
									MBF	MBF	MCF
1	Douglas-fir	SST	All	14	4,449	2,941.54	2,507.65	780.31	13,087	11,157	3,472
2	"	PT	All	2	2,140	101.20	78.20	183.50	22	17	39
3	Lodgepole Pine	SST	Med.	44	42,486	12,208.25	10,394.34	3,516.41	514,431	441,614	149,398
4	"	SST	Poor	82	128,059	4,924.92	4,078.48	1,956.23	630,680	522,286	278,645
5	"	PT	Well	24	120,164	1,068.56	863.92	2,175.91	128,402	103,812	261,466
6	"	PT	Med.	32	111,893	1,162.56	968.04	1,037.97	130,082	108,317	116,142
7	"	PT	Poor	6	24,991	666.12	542.36	580.97	16,647	13,554	14,519
8	"	S-S	Well	4	15,590	--	--	208.31	--	--	3,247
9	"	S-S	M&P	4	14,606	66.81	52.20	416.48	976	762	6,083
10	"	NS	--	2	3,310	--	--	--	--	--	--
11	Spruce-Fir	LST	Med.	6	959	35,005.19	31,637.35	5,880.37	33,570	30,340	5,639
12	"	LST	Poor	2	250	16,596.66	14,743.30	3,710.31	4,149	3,686	928
13	"	SST	Med.	34	50,030	17,472.45	15,842.18	3,851.61	874,147	792,584	192,696
14	"	SST	Poor	46	58,836	6,008.04	5,332.32	1,634.24	353,489	313,732	96,152
15	"	PT	W&M	8	10,058	570.27	492.18	485.12	5,736	4,950	4,879
16	"	PT	Poor	16	18,505	443.82	370.68	396.37	8,213	6,859	7,335
17	"	S-S	W&M	2	1,916	--	--	252.45	--	--	484
18	"	S-S	Poor	4	612	372.06	310.99	100.79	228	190	62
19	"	NS	--	2	7,576	--	--	138.11	--	--	1,046
Sub-Total									2,713,859	2,353,860	1,142,232
20	Aspen	SST	--	4	88	3,908.52	3,283.03	1,246.22	344	289	110
21	"	PT	--	20	54,522	719.70	599.72	1,296.70	39,239	32,698	70,699
22	"	SS		6	5,971	--	--	112.72	--	--	673
Sub-Total				30	60,581				39,583	32,987	71,482
Grand Total				364	673,701				2,753,442	2,386,847	1,213,714

Note: LST = Large Sawtimber; SST = Small Sawtimber; PT = Poletimber; S-S = Seedling-Saplings; NS = Nonstocked; W&M = Well and Medium; M&P = Medium and Poor.
International 1/4" and Scribner Dec. C board foot volumes are in trees 11.0" d.b.h. and larger; cubic foot is in trees 5.0" d.b.h. and larger.

Table 27

Area, Volume Per Acre, and Total Volume By Volume Stratum
For State and Privately Owned Lands

Volume Stratum				Area - Acres		Volume Per Acre			Total Volume					
									State Lands			Private Lands		
No.	Type	Stand Size Class	Stocking Class	State	Private	Int. 1/4	Scrib.	Cu. Ft.	Int. 1/4	Scrib.	Cu. Ft.	Int. 1/4	Scrib.	Cu. Ft.
									MBF	MBF	MCF	MBF	MBF	MCF
1	Douglas-fir	SST	All	256	204	2,941.54	2,507.65	780.31	753	642	200	600	512	159
2	"	PT	All	161	52	101.20	78.20	183.50	16	13	30	5	4	10
3	Lodgepole Pine	SST	Med.	386	679	12,208.25	10,394.34	3,516.41	4,712	4,012	1,357	8,289	7,058	2,388
4	"	SST	Poor	2,338	1,938	4,924.92	4,078.48	1,956.23	11,514	9,535	4,574	9,544	7,904	3,791
5	"	PT	Well	1,024	2,106	1,068.56	863.92	2,175.91	1,094	885	2,228	2,250	1,819	4,582
6	"	PT	Med.	1,315	2,574	1,162.56	968.04	1,037.97	1,529	1,273	1,365	2,992	2,492	2,672
7	"	PT	Poor	353	947	666.12	542.36	580.97	235	191	205	631	514	550
8	"	S-S	Well	60	239	--	--	208.31	--	--	12	--	--	50
9	"	S-S	M&P	48	779	66.81	52.20	416.48	3	3	20	52	41	324
10	"	NS	--	- -	134	--	--	--	--	--	--	--	--	--
11	Spruce-Fir	LST	Med.	--	25	35,005.19	31,637.35	5,880.37	--	--	--	875	791	147
12	"	LST	Poor	--	--	16,596.66	14,743.30	3,710.31	--	--	--	--	--	--
13	"	SST	Med.	388	425	17,472.45	15,842.18	3,851.61	6,779	6,147	1,494	7,426	6,733	1,637
14	"	SST	Poor	524	3,331	6,008.04	5,332.32	1,634.24	3,148	2,794	856	20,013	17,762	5,444
15	"	PT	W&M	47	593	570.27	492.18	485.12	27	23	23	338	292	288
16	"	PT	Poor	168	1,582	443.82	370.68	396.37	75	62	67	702	586	627
17	"	S-S	W&M	--	56	--	--	252.45	--	--	--	--	--	14
18	"	S-S	Poor	--	14	372.06	310.99	100.79	--	--	--	5	4	1
19	"	NS	--	2	441	--	--	138.11	--	--	--	--	--	61
Sub-Total				7,070	16,119				29,885	25,580	12,431	53,722	46,512	22,745
20	Aspen	SST	--	17	--	3,908.52	3,283.03	1,246.22	66	56	21	--	--	--
21	"	PT	--	1,668	3,073	719.70	599.72	1,296.70	1,200	1,000	2,163	2,212	1,842	3,985
22	"	S-S	--	77	181	--	--	112.72	--	--	9	--	--	20
Sub-Total				1,762	3,254				1,266	1,056	2,193	2,212	1,842	4,005
Grand Total				8,832	19,373				31,151	26,636	14,624	55,934	48,354	26,750

Note: SST = Small Sawtimber; S-S = Seedling-Sapling; LST = Large Sawtimber; PT = Poletimber; and NS = Nonstocked.
M&P = Medium & Poor; W&M = Well & Medium.

GPO 848542

2410

COMPARTMENT MAP OF LARAMIE PEAK & MEDICINE BOW WORKING CIRCLES

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

MEDICINE BOW NATIONAL FOREST
WYOMING
SIXTH PRINCIPAL MEridian
1956

1. Laramie Peak Working Circle

1 - Laramie Peak Block
001 - Laramie Peak

2 - Pole Mountain Block
002 - Pole Mountain

2. Medicine Bow Working Circle

1. Centennial Block

001 - Buckeys
002 - Carlson Creek
003 - Cooper Creek
004 - Deep Creek
005 - Dutton Creek
006 - Fence Creek
007 - Four-Mile
008 - Jim Creek
009 - Johns Creek
010 - June Creek
011 - Libby Creek
012 - Mill Creek
013 - Nash Fork
014 - North Fork Rock Creek
015 - One Mile
016 - Rock Creek Park
017 - Seven Mile
018 - Spring Creek
019 - Stud Creek
020 - Three Mile
021 - Wagon Hound

2. Foxpark Block

022 - Albany
023 - Anderson Creek
024 - Bear Creek
025 - Devils Gate
027 - Elkhorn
028 - Dave-Elk Creek
029 - Fox Creek
030 - Gramm
031 - Hans Creek
032 - Horatio Rock
033 - Illinois Creek
034 - Keystone
035 - Lake Mountain
036 - Little Beaver
037 - Moore's Gulch
038 - Mountain Home
039 - Muddy Creek
040 - North Albany
041 - Roper
042 - Savage Run
043 - Sheep Creek
044 - Smith North
045 - South Cottonwood
046 - Squirrel Creek
047 - Upper Douglas
048 - Walbright
102 - White Swan

3 - Platte River Block

049 - Barrett Creek
050 - Bear Creek
051 - Big Creek
052 - Bow River
053 - Calf Creek
054 - Cathedral Rock
055 - Coes Cabin
056 - Coon Creek
057 - Corral Creek
058 - Cow Creek
059 - East Fork Bow River
060 - East Fork Pass Creek
061 - Fish Creek
062 - Gold Hill
063 - Heather Creek
064 - Hog Park
065 - Jack Creek
066 - Lake Creek
067 - Lincoln Park
068 - Little Brush
069 - Lower Encampment
070 - Middle French
071 - North Beaver Creek
072 - North Brush
073 - North Cedar
074 - North Cottonwood
075 - North Fork Encampment
076 - North Mullen
077 - North Savery
078 - North Spring
079 - Pass Creek
080 - Rankin Creek
081 - Silver Lake
082 - Shawnee
083 - Soldier Creek
084 - South Brush
085 - South Cedar
086 - South Fork Miner
087 - South French
088 - South Mullen
089 - South Spring
090 - Turpin Creek
091 - Upper North Mullen.
103 - Six Mile Gap

4 - Snake River Block

092 - Battle Creek
093 - Big Sandstone
094 - Corral
095 - Little Sandstone
096 - Rambler
097 - Roaring Fork
098 - Savery
099 - Sheep Mountain
100 - Slater
101 - Snake River

LEGEND

- National Forest boundary
- Adjacent National Forest boundary
- Highway, hard surface
- Good motor road, graded gravel
- Motorway, improved dirt
- Poor motorway, unimproved dirt
- Trail
- Railroad
- Telephone line
- Power line
- Supervisor's Headquarters / District ranger station (Report fires here)
- Guard or ranger station (Not permanently occupied)
- Fire tool cache
- House, cabin or other building
- Improved forest camp
- Improved picnic ground
- Permanent lookout station
- Triangulation station
- Municipal and other airports
- Schoolhouse
- Sawmill
- U.S. Highway
- State Highway

Working Circle Boundary

Block Boundary

Compartment Boundary

Compartments to be Sold (10 Year Program)

1 2 3 4 — For Dev. Road & Number

Completed: 12/13/57 Revised: 6/20/60, 4/13/61

MEDICINE BOW WORKING CIRCLE (2)

HAYDEN DIVISION

MEDICINE BOW DIVISION

PLATTE RIVER BLOCK

SNAKE RIVER BLOCK

CENTENNIAL BLOCK

FOXPARK BLOCK

PLATTE RIVER BLOCK

LARAMIE PEAK DIVISION

LARAMIE PEAK BLOCK

LARAMIE PEAK WORKING CIRCLE (1)

POLE MTN. BLOCK

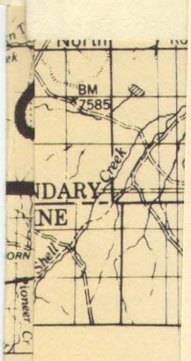
R. 89 W. R. 88 W. R. 87 W. R. 86 W. R. 85 W. R. 84 W. R. 83 W. R. 82 W. R. 81 W. R. 80 W. R. 79 W. R. 78 W. R. 77 W. R. 76 W. R. 75 W. R. 74 W. R. 73 W. R. 72 W. R. 71 W. R. 70 W.

T. 12 N. Colo. T. 12 N. Wyo. T. 13 N. T. 14 N. T. 15 N. T. 16 N. T. 17 N. T. 18 N. T. 19 N. T. 24 N. T. 25 N. T. 26 N. T. 27 N. T. 28 N. T. 29 N. T. 30 N. T. 31 N.

U.S. Forest Service
Denver, Colo. 1955

Longitude west from Greenwich

Polyconic projection
North American datum


BM
7585
Creek